Heavy "SM-like" Higgs

$\sqrt{s}$ = 800 GeV
M(H) = 500 GeV
Γ(H) = 70 GeV
$\sigma(H\nu\nu)$ = 10 fb
σ(HZ) = 6 fb
B(WW) = 55%
B(ZZ) = 25%
B(ttbar) = 20%

TESLA 800 GeV

luminosity: 5 x 10^34
http://www.desy.de/~njwalker/ecfa-desy-wg4/parameter_list.html
Assume 5 yrs running at 10^7 s/year
gives $\int L$ = 2500 fb^-1 or 40K Higgs

LHC Capabilities:

Use H->ZZ->4 lepton final state
Mass measured to…… 0.3 %
Width measured to…… 6 %
σxB(H->ZZ) measured to… 12 %
(assuming 10% luminosity error)

- Discovery at LHC
- Mass and total width at LHC
- Likely on ratios of BR's known
  - WW/ZZ
  - WW/ttbar probably not known
- Spin and parity

Next Steps

- Focus on BR extraction
  - integrated luminosity known
  - separate HZ from WW fusion
  - each final state identifiable
- Study spin-parity determination
- Theoretical understanding
  - model independent “SM-like”
  - needed precision for sensitivity to new physics the new physics scale
- Simulate with NLC99